CLAIMS

1. A diode pumped, intracavity doubled laser, comprising:

at least two resonator mirrors defining a resonator cavity;

an Nd:YVO_4 laser crystal positioned in the resonator cavity;

an LBO doubling crystal positioned in the resonator cavity;

a diode pump source supplying a pump beam to the laser crystal and producing a laser crystal beam with at least one axial mode that are incident on the doubling crystal to produce a frequency doubled output beam with an output power of at least 1 watt, wherein the diode pump source is configured to be coupled to a power supply.

2. The laser of claim 1, wherein the output power is at least 2 watts.

3. The laser of claim 1, wherein the output power is at least 3 watts.

4. The laser of claim 1, wherein the output power is at least 4 watts.

5. The laser of claim 1, wherein the output power is at least 5 watts.

6. The laser of claim 1, wherein the output power is at least 10 watts.

7. The laser of claim 1, wherein the output power is at least 15 watts.

8. The laser of claim 1, wherein the output power is at least 20 watts.

9. The laser of claim 1, wherein the doubled output beam has a % RMS noise of less than 0.5%.

10. The laser of claim 1, wherein the doubled output beam has a % RMS noise of less than 0.3%.

11. The laser of claim 1, wherein the doubled output beam has a % RMS noise of less than 0.2%.

12. The laser of claim 1, wherein the doubled output beam has a % RMS noise of less than 0.1%.

13. The laser of claim 1, wherein the diode pump source is a diode bar.

14. The laser of claim 1, wherein the diode pump source is a plurality of diode bars.

15. The laser of claim 1, wherein the diode pump source is fiber-coupled.

16. The laser of claim 1, wherein at least four axial modes are incident on the doubling crystal.

17. The laser of claim 1, wherein at least five axial modes are incident on the doubling crystal.

18. The laser of claim 1, wherein at least 10 axial modes are incident on the doubling crystal.

19. The laser of claim 1, wherein the output beam is substantially TEM_{oo}.